

Sharps Safety Matters

Where to find safety products? —Part One —

by Ron Stoker

The Occupational Safety and Health Administration's (OSHA) bloodborne pathogens standard requires employers to evaluate safer medical devices to eliminate or minimize employee exposure to blood or other potentially infectious materials, also known as OPIM. Engineering controls, including safety products, must be implemented where their use is feasible, and it is imperative for each facility to modify and update their exposure control plan. The plan must reflect appropriate changes in technologies that eliminate or reduce exposure to bloodborne pathogens.

OSHA requires that healthcare facilities solicit input from non-managerial employees who are responsible for direct patient care. That way those who are potentially exposed to injuries from contaminated sharps are able to assist in the identification, evaluation and selection of effective engineering and work practice controls.

It is important to document the identification, evaluation and implementation of appropriate commercially available and effective safer medical devices designed to eliminate or minimize occupational exposure. As far as OSHA is concerned, if it isn't documented it didn't happen!

One of the challenges that healthcare workers and managers have is "where do I find safety products." To this end, the International Sharps Injury Prevention Society (ISIPS) has created a comprehensive safety product list. It has been requested by many to publish the list again this year. The list contains a product category and category description, followed by a list of safety products including company name and a Web site where more information can be obtained. In this first of a three-part series, safety products in categories A through F are presented.

Air Bubble Removal Devices

Clinicians must expel air bubbles from blood samples safely without exposure to blood or bloodborne pathogens. Allows air out the filter end but does not allow blood. This device eliminates accidentally expelled blood droplets caused by aerosolizing air bubbles from a blood-filled syringe.

- ▶ Filter-Pro™ air bubble removal device; Smith's Medical, www.smiths-medical.com.

Allergy Syringes

Allergen immunotherapy (allergy injection treatment) consists of repeated injections of one or more mixtures of extracts of allergens over a period of several years. A variety of allergy syringes are available with retractable needles, or shielded needles.

- ▶ SurGuard Safety Allergy Syringes and Trays; Terumo, www.terumotmp.com.

- ▶ BD SafetyGlide™ Syringe for Allergy; BD, www.bd.com.
- ▶ Hypodermic Needle-Pro® Safety Allergy Tray and needles; Smiths Medical, www.smiths-medical.com.
- ▶ InviroSNAP! Safety Syringe Allergy Tray; Inviro Medical, www.inviromedical.com.
- ▶ MONOJECT™ Allergy Trays; Covidien, www.kendallsharpsafety.com.
- ▶ VanishPoint® Allergy Syringe Tray and syringes; Retractable Technologies Inc., www.vanishpoint.com.

Amniocentesis Trays

Amniocentesis is a procedure where fluid is aspirated out of the amniotic sac. Fetal urine, fetal cells, and various proteins move freely within this sac. During amniocentesis, a long needle is placed through the abdominal wall and into the amniotic sac. Once the needle is in the amniotic sac, a syringe is used to aspirate the amniotic fluid. The fluid is then sent for evaluation. New technologies provide safety sharps that can protect the user from needlesticks.

- ▶ Amniocentesis Tray; Smiths Medical, www.smiths-medical.com.
- ▶ Curity Amniocentesis Tray; Covidien, www.kendall-healthcare.com.
- ▶ Safe-T-Amnio™ Tray; Cardinal Health, www.cardinal.com.

Ampoule Breaker

Ampoules are small glass vessels in which liquids for injections are hermetically sealed. When the cap is snapped off, glass chips can fly off and a jagged or sharp edge can cut the hands of clinicians and others. The scoring at the neck does not always break where it is intended. This is due to the glass re-melting to some degree at the score line. In one study more than 62 percent of nurses said that they have been cut by a broken glass ampoule. Safety ampoule breakers prevent this problem by covering the glass ampoule during the breaking process, thus protecting the clinician's hands.

- ▶ Ampoule Breaker; Millipore Inc., www.millipore.com.
- ▶ Ampoule Opener; Health Care Logistics, www.healthcarelogistics.com.
- ▶ SafeBreak™; Medi-Dose Inc., www.medidose.com.
- ▶ Snapit™ Ampoule Opener; Qlicksmart, www.qlicksmart.com.

- ▶ DAB Disposable Ampoule Breakers; Star Systems LLC, www.starrsystemsllc.com.
- ▶ Ampoule Adapters; West Pharmaceutical; www.westrestitution.com.

Apheresis Needles

Apheresis is a special blood donation procedure in which plasma or selected cellular elements, such as platelets or white cells, are separated from the other parts of the blood and retained. Blood is drawn and processed through a cell separator, and the other cells and plasma are returned to the body. Apheresis takes approximately two hours compared with a whole blood donation of about eight to 10 minutes. During apheresis, the patient or donor is connected to the apheresis machine. A needle is inserted into a vein in each arm. Blood is withdrawn from one arm, run through the machine to extract the stem cells, and all the remaining components of the blood are returned to the donor through the needle in the other arm. In the case of a patient donating their own stem cells, this process is performed using a central venous catheter, which has two lumens.

- ▶ ITL Playtypus® Needle Guard, for use with Apheresis and AV Fistula needles, (available outside of the United States); ITL, www.itlcorporation.com/platypus.php.
- ▶ MasterGuard Anti-Stick Needle Protector, Medic Anti-Stick Needle/Connector; Medisystems Corp; www.medisystems.com.
- ▶ Nipro SafeTouch Fistula Needles; Rockwell Medical Technologies Inc., www.rockwellmed.com.
- ▶ SysLoc Safety A.V. Fistula Needle Set, WingEaster A.V. Fistula Needle Guard; JMS North America Corporation, www.jmsna.net.



Nipro SafeTouch Fistula Needles are used during apheresis procedures and protect against an accidental needlestick injury.

Arterial Blood Gas Syringes

Arterial blood must be used for ABG measurement rather than venous blood because only arterial blood accurately reflects the amount of pO₂ transferred from the lungs. Specialized safety products are used for this.

- ▶ Micro ABG Arterial Blood Gas Sampling Kits, Quik ABG Syringes; Vital Signs Inc., www2.vital-signs.com/VSIHome/html/english/default.aspx.
- ▶ Pulsator® Plus Syringes with Dry Heparin, Pulsator® Plus Syringes with Dry Heparin, Pro-Vent Plus; Smiths Medical, www.smiths-medical.com.
- ▶ Pulset ABG Syringe; Westmed Inc., www.westmedinc.com.
- ▶ safePICO Self-Filling Arterial Sampler; Radiometer America Inc., www.radiometeramerica.com.

Arterial Catheter Stabilization Products

Arterial catheter stabilization products are designed to hold arterial lines in place throughout therapy. Rather than using sutures, with the inherent suture wounds and the potential for accidental needlesticks—just stabilization.

- ▶ Statlock Arterial Stabilization Device; CR Bard, www.statlock.com.
- ▶ Zefon Arterial Anchor Bandage; Zefon International Inc., www.zefon.com.

Arterial Line Draw

Arterial and venous infusion lines are used to introduce fluids into the blood stream of a patient. Typically the injection site is also used to take periodic blood samples from the patient.

- ▶ Deltran® Plus closed needleless arterial blood collection system; Utah Medical Products, www.utahmed.com/deltranplus.htm.
- ▶ Venous Arterial blood Management Protection (VAMP) Plus, Vamp Adult, Vamp Jr.; Edwards Life Sciences, www.edwards.com.
- ▶ Portex® Line Draw Plus and Umbilical Line Draw; Smiths Medical, www.smiths-medical.com.

Automated Filling of IV Syringe Doses

The standard method of filling syringes manually creates many opportunities of accidental needlesticks and other occupational exposure to medications. Automated systems are available that make the filling of syringes safer.

- ▶ Exacta-Mix™ 2400 Compounder (EM2400), Rapid-Fill™ Automated Syringe Filler (ASF); Baxa, www.baxa.com.

Bifurcated Needles

Bifurcated needles administer vaccines by the scarification method. There is currently only one safety bifurcated needle available for smallpox vaccinations if they become necessary again.

- ▶ BD Eclipse™ Bifurcated Needle; BD, www.bd.com.

Biohazard Spill Kit

A biohazard spill clean-up kit provides everything necessary for clean up of bodily fluids such as blood, vomit, urine, etc.

- ▶ Sharps Biohazard Spill Kit Disposal by Mail System; Sharps Compliance Inc.; www.sharpsinc.com.

Bleeding Time Devices

Bleeding time products make an incision and are then discarded into an approved sharps container. A timer is started and the edge of the incision is blotted at 30-second intervals with filter paper. The time that the bleeding stops is noted.

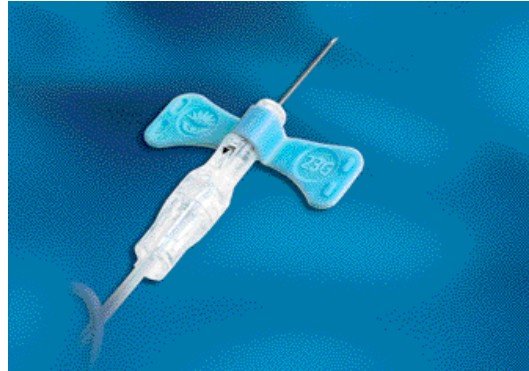
- ▶ Surgicutt® bleeding time; International Technidyne Corporation (ITC), a subsidiary of Thoratec Corporation, www.itcmed.com.

Blood Collection

Blood drawing is the process of obtaining a sample of venous blood to assist in diagnosis. Typically a 5 ml to 25 ml sample of blood is adequate depending on what blood tests have been requested. A variety of devices are available to draw blood into evacuated tubes.

- ▶ Hypodermic Needle-Pro® EDGE™ Safety Device, Saf-T Holders, Saf-T-Clik Blood Tube Holder, Venipuncture Needle-Pro Device (blood tube holder with needle shield attached); Smiths Medical, www.smiths-medical.com.
- ▶ SurShield™ Safety Winged Blood Collection, SurShield™ Safety Winged Infusion sets; Terumo Medical, www.terumotmp.com.
- ▶ Microvette® Capillary Blood Collection System, Multifly®, S-Monovette® Blood Collection System; Sarstedt, www.sarstedt.com.
- ▶ ProGuard II™ Safety Needle Holder, Defender Safety Needle Holder, MONOJECT MAGELLAN™ Safety Blood Collection Device, MONOJECT™ ANGEL WING™ Blood Collection Sets with Needle Holder, MONOJECT™ ANGEL WING™ Blood Collection/Infusion Sets with Female Luer, MONOJECT™ ANGEL WING™ Blood Collection/Infusion Sets with Multi-Sample Luer Adapter, ANGEL WING™ Blood Collection Assembly with MONOJECT BLUNTIP™ Safety I.V. Access Cannula, ANGEL WING™ Luer Lock Collection Set, MONOJECT™ ANGEL WING™ Multi-Sample Collection Sets-Male; Covidien, www.kendallhealthcare.com.
- ▶ ITL Samplok® Tube Holders; ITL, www.itlcorporation.com/samplok.php.
- ▶ VACUETTE® QuickShield Tube Holder, VACUETTE® VISIO PLUS Blood Collection Needle, VACUETTE® Safety Tube Holders, VACUETTE® Safety Blood Collection Sets, MiniCollect Capillary Blood Collection System; Greiner Bio One, www.gbo.com/preanalytics.
- ▶ Vacutainer Eclipse Blood Collection Needle, Vacutainer® Push Button Blood Collection Set, Vacutainer® Safety-Lok™ Blood Collection Set, Eclipse Safety Shielding Blood Collection Needle, One Use Stackable Holder, Vacutainer Passive Shielding Blood Collection Needle with Integrated Blood Tube Holder, Vacutainer® Eclipse™ Blood Collection Needle, Vacutainer® Push Button Collection Set, BD Vacutainer Flashback Needle; BD, www.bd.com.
- ▶ VanishPoint Blood Collection Tube Holder (needle-retracting tube holder with back-end needle protection); Retractable Technologies, www.vanishpoint.com.

- ▶ One Stick Y extension set with Volumeter; One Stick LLC, www.1stick.com.
- ▶ Punctur-Guard Blood Collection Needle; Gaven Medical; www.gavenmedical.com.



BD Vacutainer® Push Button Blood Collection Set. In-vein activation reduces the risk of healthcare worker exposure to a contaminated needle.

Blood Culture Bottles

A blood culture is a laboratory test in which blood is injected into bottles of culture media to determine whether microorganisms have invaded the patient's bloodstream. These blood cultures are ordered as a set consisting of two bottles, one that is an aerobic bottle and one that is an anaerobic bottle. A blood culture is done when a person has symptoms of a blood infection or bacteremia. Blood is withdrawn from the person and is then tested in a laboratory to find and identify any microorganism present and growing in the blood. This allows the physician to prescribe antibiotics if a microorganism is found. Blood is drawn from a person suspected of blood infection and is put directly into a blood culture bottle containing a nutritional broth. Some culture bottles allow clinicians to use safety needled products in transferring the blood.

- ▶ BD BACTEC™/F Blood Culture Procedural Trays; BD, www.bd.com.
- ▶ WorkSafe™ Blood Culture Kit; bioMérieux Inc., www.biomerieux-usa.com.

Blood Culture Bottle Sample Introduction

These products are used to collect samples into vacuum blood culture bottles for bacterial detection and test tubes for laboratory tests.

- ▶ MONOJECT™ ANGEL WING™ BacT/ALERT™* Blood Collection Device-Male,

MONOJECT™ ANGEL WING™ BacT/ALERT™* Transfer Device-Female; Tyco Healthcare/Kendall, www.kendallsharpsafety.com.

- ▶ ITL Samplok® Sampling Kit, Samplok® Adapter Cap; ITL, www.itlcorporation.com/ssk.php.

Blood Donor Needles

Blood donor needles transfers blood from a blood donor into donor bags. Following the blood donation the needle is retracted or shielded to prevent needlestick injuries.

- ▶ ITL DonorCare® Needle Guard for use with blood collection bag needles; ITL, www.itlcorporation.com.
- ▶ Samplink Blood Donor System; Baxter, www.baxter.com.
- ▶ TERUFLEX® Blood Bags with Blood Sampling Arm® and DonorCare® Needle Guard; Terumo, www.terumo-transfusion.com.

Blood Filtration Set

Blood filtration set designed for the neonatal infusion of frequently administered small volumes of blood, blood components and other fluids subject to micro filtration. The filtration set replaces a needle filter.

- ▶ Hemo-Nate® blood filtration set; Utah Medical Products Inc., www.utahmed.com/hemonate.htm.



Blood Slide Preparation Devices

These products eliminate the need to remove the stopper from the blood tube. The old and potentially dangerous method to prepare differential slides was to take two glass slides, open a blood tube by removing its cap, place a drop of blood onto one of the slides and then place one slide against the other one. New safety products can eliminate the potential of exposure to bloodborne pathogens and without the risk of broken glass or blood splatter.

- ▶ Diff-Safe Blood Dispenser; Alpha Scientific Corp., www.alpha-scientific.com.
- ▶ Haemo-Diff Blood Smear; Sarstedt, www.sarstedt.com.
- ▶ H-Pette Slide Preparation Device; Helena Laboratories, www.helena.com/miscPlastics.htm.

Blood Splash Protection

OSHA has recommended that healthcare workers protect themselves from biohazardous splashes, aerosols and sprays. One method of doing this is by using transparent shields that can limit bloodborne pathogen exposures.

- ▶ Safety Shield™; ITL Corporation, www.itlcorporation.com.
- ▶ Splash Guard; Medegen Medical, www.medegen.com.
- ▶ Face-it™ Shields; Onyx Medical; www.onyxmedical.com.

Blood Transfer Devices

Blood can sometime need to be transferred from a syringe draw to an evacuated tube. Safety products can be used to eliminate sharps and bloodborne pathogen exposure during this process.

- ▶ BD Vacutainer® Blood Transfer Device; BD, www.bd.com.
- ▶ ITL Samplok® Sampling Kit; ITL, www.itlcorporation.com/ssk.php.
- ▶ MONOJECT ANGEL WING Blood Transfer Device, MONOJECT™ ANGEL WING™ Multi-Sample Transfer Sets-Female, MONOJECT™ ANGEL WING™ Multi-Sample Transfer Sets-Male; Covidien, www.kendallhealthcare.com.
- ▶ Blood Transfer Device; Greiner Bio-One, www.gbo.com/preanalytics.
- ▶ Saf-T Holder®; Smiths Medical, www.smiths-medical.com.

Blunt Cannula Needles

Blunt cannula needles can be used in a variety of settings where a cannula is needed but a sharp one is not required.

- ▶ Blunt Cannula Needle; AliMed, www.alimed.com.
- ▶ MONOJECT BLUNTIP™ Needleless Safety I.V. Access Cannula with Medication Vial Access Pin; Covidien, www.covidien.com.

Blunt Suture Needles

Blunt needle cannula complies with OSHA Bloodborne Standard for Engineering Controls. Blunt needles can be used to access pre-pierced ports, and single or multi-dose drug vials. Use of these products can increase safety and ease of use by decreasing the number of steps required to draw and deliver intravenous fluids.

- ▶ Auto Suture™ ENDO STITCH™ 10 mm Suturing Device, PROTECT•POINT™ Blunt Point Needles; U.S. Surgical, www.syneture.com.
- ▶ Ethiguard Blunt Point; Ethicon Inc., www.ethicon.com.

Bone Marrow Biopsy Needle Kits

Bone marrow biopsy needle kits provide all of the components necessary to acquire bone marrow aspirate with safety components included in the kit.

- ▶ Kendall® GOLDENBERG SNARECOIL™* Bone Marrow Biopsy and Aspiration Trays with Safety Components, Kendall® MONOJECT™ Bone Marrow Biopsy Trays with

Safety Components, MONOJECT™ Bone Marrow Aspiration Trays with Rosenthal Type Needle with Safety Components, MONOJECT™ Bone Marrow Biopsy Trays with Safety; Covidien, www.kendallhealthcare.com.

Bone Marrow Collection Systems

Closed system that allows for the collection of bone marrow aspirates without healthcare worker exposure.

- ▶ Bone Marrow Collection System with Sealed Collection Bag; BioAccess, www.bioaccess.com.

Bone Mill, Disposable

Bone mills are used to grind bone to be used for spinal fusion, orthopedic reconstruction, and maxillofacial procedures. These procedures expose healthcare workers to sharps injuries. A disposable bone mill can eliminate exposure to sharp injuries for hospital staff, as well as cross-contamination for patients and OR personnel. Since the disposable mill is thrown away after each procedure, there is no risk for bloodborne pathogen exposure.

- ▶ Bone Shark Disposable Bone Mill; Medical Innovators, www.medicalinnovators.net.

Capillary Blood Collection

Capillary blood sampling is used when only small amounts of blood are needed for testing. A capillary puncture may be used when venipuncture would be too invasive or when other clinical features are manifest such as extensive scarring, bruising, obesity, and so on.

- ▶ Capi-Draw Capillary Blood Collection System; Innovative Medical Technologies Inc., www.innovativemedtech.com.
- ▶ Microvette Capillary Blood Collection System, Multivette Capillary Blood Collection System; Sarstedt Inc., www.sarstedt.com.
- ▶ MiniCollect Capillary Collection System; Greiner Bio-One, www.gbo.com/preanalytics.

Carpject Safety Needle Systems

Carpject syringe systems consist of prefilled cartridges that can be loaded into a specialized syringe holder. The holder is a reusable, plastic device. The other component is a disposable cartridge unit containing medication.

- ▶ Carpject® Needle-Pro® device; Smiths Medical, www.smiths-medical.com.

Cataract Safety Scalpel

Specially designed, integrated retractable shield that protects the blade in procedure and handling. Allow the incision is scleral or corneal.

- ▶ BD Beaver Safety Cataract Knives, BD Atomic Edge™ Safety Knives; BD, www.bd.com/ophthalmology/products/cataract/atomicedge/.

- ▶ Diamatrix Sharps Safety Stainless Steel Knife, Diamatrix Surgical Steel E-Series® Trapezoid blade; Diamatrix, Ltd., www.diamatrix.com.
- ▶ Sharpoint™ Sharpguard™ Guarded knives; Surgical Specialties Corporation (DBA Angiotech), www.sharpoint.com.

Catheter Securement Devices

According to the CDC, sutureless securement devices can be advantageous over suture securement in preventing catheter-related BSIs. The Infusion Nurses Society (INS) has indicated that using a manufactured stabilization device is preferred to suturing or taping.

- ▶ Cathsling™; For Patient's Inc., www.forpatientsinc.com.
- ▶ Centurion® WingGuard™ PICC Catheter Securement Device; Tri-State Hospital Supply Corp, www.tristate.com.
- ▶ GRIP-LOK™ Universal Securement; Zefon International Inc., www.zefon.com.
- ▶ I.V. PRO™ IV SITE PROTECTOR; Medi-Dose Inc., www.medicdose.com.
- ▶ LockIt Plus™ Catheter Securement Device; Smiths Medical, www.smiths-medical.com.
- ▶ Merit Revolution™; Merit Medical, www.merit.com.
- ▶ StatLock Securement System; Bard Medical Systems, www.statlock.com.
- ▶ TriSecure® Catheter Securement Device; Maximus Medical, www.maximusmedical.com.

Central Venous Catheters

A central venous catheter (CVC) is placed into a large vein in the neck (internal jugular vein), chest (subclavian vein) or groin (femoral vein). Central venous catheters are used to deliver medication, fluids, obtain blood tests and obtain cardiovascular measurements including some tests as central venous pressures.

- ▶ Central Venous Catheterization Kit with Integral Needle Protection; Arrow International, www.arrowintl.com/products/all/catalog.asp?ID=7.

Cerclage Fixation of Osteotomized or Fractured Bone Fragments

Traditional cerclage fixation is performed with metallic wires and cables, which are stiff and prone to breakage during tightening in the OR and while the patient performs normal activities of daily living. These broken metal wires and cables present sharp metallic ends that pose a significant risk of injury and potential disease transmission for the surgeon, staff and patient. The medical literature is replete with references to such hazards. Newer technologies eliminate such risks because they are engineered from a flexible polymer material that is strong, soft, and “friendly” to both gloves and tissue.

- ▶ Supercable™ Iso-Elastic™ Cerclage System; Kinamed Incorporated, www.kinamed.com.

Chemotherapy Reconstitution Products

Products in this category are designed to help prevent aerosolization of chemotherapy and other hazardous drugs into the atmosphere during reconstitution.

- ▶ CHEMOBLOC™ Vial Venting System; Covidien, www.kendall-ltp.com/Kendall-LTP.

Chemo Waste Sharps Containers

Specialized containers to place needles and other sharps into as mandated by law. In addition, these containers are used for chemotherapy waste products.

- ▶ B-D Multi-Use One-Piece Sharps Containers, BD Chemo Waste 9 gal. 17 gal.; BD, www.bd.com.
- ▶ Chemo Waste Sharps Container; Health Care Logistics Inc., www.healthcarelogistics.com.
- ▶ Chemotherapy container; Bemis, www.bemis.com.
- ▶ CHEMO-O-GATOR™ Sharps Containers, CHEMOSAFETY™ Containers with Hinged Lids, CHEMOSAFETY™ Containers with Sliding Lid, SharpSafety™ Chemotherapy Sharps Containers; Covidien, www.kendallhealthcare.com.

Closed Arterial Sampling

Closed needleless arterial blood collection systems are designed to reduce the risk of nosocomial infection or line sepsis, reduce splashing and spraying of blood during sampling and reduce the potential exposure from needlesticks.

- ▶ BD Safedraw™ Closed Loop Blood Sampling System; BD, www.bd.com.
- ▶ Deltran® Plus Kit; Utah Medical Products, www.utahmed.com.
- ▶ Saf-T Closed Blood Collection System™ Devices; Smiths Medical, www.smiths-medical.com.

Closed Venous Sampling

Closed needleless venous blood collection systems are designed to reduce the risk of nosocomial infection or line sepsis, reduce splashing and spraying of blood during sampling and reduce the potential exposure from needlesticks.

- ▶ BD Safedraw™ Closed Loop Blood Sampling System, BD Safe Draw Closed Loop Blood Sampling System; BD, www.bd.com.
- ▶ Saf-T Closed Blood Collection System™; Smiths Medical, www.smiths-medical.com.
- ▶ SafeSet™ Closed Blood Sampling System; Hospira, www.hospira.com/Products/safeset.aspx.

Closed System Antineoplastic Systems

An important part of treatment for cancer patients is the use of antineoplastic agents. Unfortunately, these agents have been

associated with potential adverse health effects for the individuals who prepare, administer and dispose of these medications. This is a major concern because there are more cancer patients than in the past, greater combinations of chemotherapeutic drugs are being used, more potent drugs are being used, and new procedures and settings have now been implemented. Often the drugs used for chemotherapy have a similar structure or activity known to hazardous drugs. Many of these drugs are carcinogenic, teratogenic, and can create reproductive and organ toxicity. Closed system protective devices can virtually eliminate any exposure of toxic drugs to healthcare workers, custodial staff or waste management employees.

- ▶ ONGUARD™ Contained Medication System with TEADAPTOR™ Components; B Braun, www.bbBraun.com.

Cord Clamping Products

Two plastic clamps are placed on the cord and then are severed with scissors. Both disposable and reusable scissors are a potential source of sharps injuries to healthcare workers and others. Newer technologies exist that can take the risk of a sharps injury out of this procedure.

- ▶ ClampCut SCC-23; Price Invena, www.priceivena.dk/index.htm.
- ▶ ClampCut SCC-23; BioMedical International Corp., www.biomedicalintl.com.

Cord Blood Collection Products

Cord blood collection products are designed to obtain samples of venous umbilical cord blood after delivery of a newborn infant and aids in the prevention of needlestick injuries.

- ▶ LIFE TRACE™ Umbilical Blood Collection Kit; Covidien; www.kendall-ltp.com/Kendall-LTP.
- ▶ ITL DonorCare® Needle Guard for use with blood collection bag needles; ITL, www.itlcorporation.com/donorcare.php.
- ▶ CordGuard; Utah Medical, www.utahmed.com.
- ▶ Cord Stick™ Multiple Draw System; Cord Stick Corp., www.cordstick.com.
- ▶ UmbiliCup; DeRoyal, www.deroyal.com.

Dental Anesthesia, Automatic

Computer controlled local anesthesia delivery enhances the injection process for both the dentist and the patient. Safety products retract the needle after injection making it safe for dental professionals.

- ▶ STA-Single tooth administration with SafetyWand; Milestone Scientific, www.milesci.com.

Dental Anesthesia Syringe

Dental Anesthetic Syringes provide one-handed, single-use, disposable syringe injectors for the delivery of dental anesthetics.

- ▶ Ultra Safety Plus XL Safety Syringe; Septodont Inc., www.septodontinc.com.

Epidural Needle

Safety Epidural Needles help anesthesiologists meet OSHA guidelines while taking care of the needs of patients.

- ▶ Perifix® Safety Epidural Needle; B. Braun Medical Inc., www.bbraun.com.

Epidural Continuous Infusion Trays

Safety epidural trays have safety components that keep clinicians safe from needlestick injury and bloodborne pathogen exposure.

- ▶ Continuous Epidural Tray with Needle Safety; Smiths Medical, www.smiths-medical.com.
- ▶ Perifix® Safety Continuous Epidural Trays; B. Braun Medical Inc., www.bbraun.com.

Evacuated Blood Tubes, Plastic

Glass evacuated blood tubes have been used for decades and they frequently break exposing clinicians to unnecessary risks. Plastic Evacuated Blood Tubes are available for a variety of tests.

- ▶ MONOJECT™ CORVAC™ Red/Grey Mottled Stopper-Plastic Tube; Covidien, www.kendallsharpsafety.com/sharpsafety.

Face Shields

Face shields protect the face from blood splash incidents.

- ▶ Face-it Face Shields; Onyx Medical, www.onyxmedical.com/03-Face-Fog/06-FaceIt/index.html.

Minimize Peripheral IV Complications

The combination of MaxPlus® Clear™ positive displacement connector and True-Secure® Peripheral Catheter Securement minimize complications such as occlusion and dislodgement that can lead to dangerous reinserts.



MaxPlus Clear

- Flat, smooth surface for optimal disinfection
- Positive displacement technology keeps catheter patent
- Clear fluid path allows for enhanced flushing technique

True-Secure

- Non-bracketing form safely secures peripheral catheter
- Protects insertion site with a clear bio-occlusive dressing
- Allows for complete visualization of access site and surrounding skin



Reader Service No. 63



Face-it™ Shields from Onyx Medical protect against unwanted blood exposure.

Fascia Closing Device

Accidental suture needlesticks are the leading cause of sharps injury in the operating room. Suture needlesticks have been reported at rates as high as one in every 18 surgical cases, placing surgeons and OR personnel at serious risk of life-threatening infections.

- ▶ The SutureTek Fascia Closure Device; Suturetek Incorporated, www.suturetek.com.

Finger Incision Devices

One method for blood collection when very little blood is needed is the finger-incision method. These products have a hidden blade that incises the skin to a controlled, standardized depth. The device creates a shallow incision in the finger which cuts more of the capillary bed without cutting too deeply, thus allowing blood to flow freely for a high quality blood specimen.

- ▶ Tenderlett® finger incision devices; International Technidyne Corporation (ITC), www.itcmed.com.

Finger Protection

This category features devices used to provide needlestick protection during gynecological and urological surgical procedures. These products facilitate suture placement and tissue dissection and can be used in surgical procedures of other specialties. They are radiopaque for identification during radiological studies.

- ▶ Digicap; Marina Medical, www.marinamedical.com.

Finger-stick Sampling

When only small quantities of blood are needed for testing a small sample of blood can be obtained by

means of a finger stick. A finger stick describes the process of puncturing or incising the skin with a small sharp blade. The blood is allowed to pool on the finger tip and a small capillary tube is placed against the blood where it is aspirated up into the tube.

- ▶ Microvette Capillary Blood Collection System, Multivette Capillary Blood Collection System; Sarstedt Inc., www.sarstedt.com.
- ▶ MiniCollect Capillary Collection System; Greiner Bio-One., www.gbo.com/preanalytics.
- ▶ SAFE-T-FILL Capillary Blood Collection; RAM Scientific, www.ramsci.com.

Flu Syringe

The CDC has recommended all healthcare providers, as well as those in training for healthcare professions, be vaccinated annually against influenza. It is important that institutions use safety syringes when administering flu shots to their employees.

- ▶ BD SafetyGlide™ Syringe, BD Integra™ Flu Syringe with Retracting BD PrecisionGlide™ Needle; BD, www.bd.com.
- ▶ Flu Trays and Syringes; Terumo, www.terumotmp.com.
- ▶ Hypodermic Needle-Pro® Safety Flu Tray and needles; Smiths Medical, www.smiths-medical.com.
- ▶ MONOJECT™ Allergy Trays; Covidien, www.kendallsharpsafety.com.
- ▶ Invirosnap! Safety Syringe Flu Trays; Invirosnap Medical, www.invirosnap.com.
- ▶ VanishPoint® Flu Syringe Tray and syringes; Retractable Technologies Inc., www.vanishpoint.com. †

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Author's note: Even with months of preparation, this list is incomplete but the author believes that it contains more safety products and categories than has previously been assembled together in one list. The intent is to include all safety products that are currently available in the marketplace. The author is indebted to those that have provided information on safety products. If you are aware of safety products that have not been included in this list, please send an e-mail to info@isips.org. This list is copyrighted by ISIPS and may not be republished without the expressed written consent of the author. Please contact the author to add additional company and product names at info@isips.org.

Advances in Blood Drawing Using Evacuated Tubes

Improving patient and clinician safety

by Ron Stoker

Dr. Charles Gabriel Pravaz (1791-1853), a French surgeon, and Alexander Wood (1817-1884), a Scottish physician, independently invented the hypodermic syringe. It was first used to inject morphine. It had a hollow pointed needle, made of steel, with a hard rubber hub. In 1897 Maxwell W. Becton and Farleigh S. Dickinson formed a company and started manufacturing an all-glass syringe imported from France.

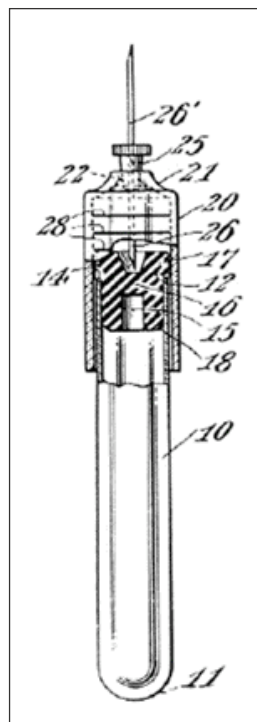
The world of drawing blood has changed radically from those days. In the early 1970s it was much more difficult to obtain a blood sample. There were no evacuated tube systems at the time. The laboratory staff would have to prepare a variety of solutions to be placed into glass test tubes. These solutions included EDTA, Citrate, and others. These solutions were dispensed into test tubes to prevent the coagulation of blood. In order to make sure that the proper amount of blood was placed into each test tube, the laboratory staff had to etch lines into the borosilicate glass tubes.

The phlebotomist would then collect blood specimens with needles and glass syringes. The phlebotomist would have to stick the patient many times providing samples for the chemistry lab, the hematology lab and for coagulation studies. The phlebotomist would then transfer the blood into a series of test tubes. Tubes were sealed with black rubber stoppers so that they could be transported to the laboratory.

This was before the day of disposable medical devices. After concluding all the tests laboratory personnel would have to wash the syringes and the test tubes for the next patient. Removing blood from the glass tubes was difficult but even more difficult was washing off the soap residue. Many rinses were needed to remove it. The needles were then re-sharpened using a grinding wheel, washed again and then re-sterilized. Can you imagine having to do all that?

Patients did not enjoy the multiple needle entries into the vein. There were many opportunities for errors to occur during the collection and transfer process.

Figure 1.
A drawing from Joseph Kleiner's "Evacutainer" patent.



The introduction of evacuated blood collection systems provided greater safety, while offering ease-of-use and speed. However, it also provided additional challenges. How was this procedure accomplished?

The evacuated blood collection system consisted of a needle assembly which had a distal needle that was inserted into the patient and a proximal needle that was in the backend of the holder. During a blood drop procedure, the distal end of the needle would enter into the patient's vein. The evacuated tube would be pushed down onto the proximal needle so that blood entry from the patient would fill up the evacuated tube. The vacuum enabled the tube to fill out with the appropriate volume of blood. When multiple specimens were required, additional evacuated tubes would then be inserted into the holders after the completion of the previous draw.

The first evacuated tube was invented by Joseph Kleiner and was called the "Evacutainer."¹ See Figure 1. He subsequently assigned the patent to BD in 1949 and was hired as a consultant to the company. Although this development made blood sampling easier it was not without its own set of problems.

When the distal needle is inserted into a vein the blood flows from the distal needle to the proximal needle. This proximal needle, capable of penetrating the plug on the evacuated tube, was always left open. Blood flowing under its own pressure from the vein would flow past the proximal needle and into the holder leading to blood loss, discomfort for patients and bloodborne pathogens exposure. When the evacuated tube was removed, blood would continue to drip into the holder.

In 1973, Sinae Miyake came up with a clever innovation that would eliminate some of these problems. His idea was to put